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ABSTRACT

This manual contains statistical information on the examinations administered by the National Occupational Competency Testing Institute (NOCTI) to measure occupational competencies of experienced craftsmen in twenty-six trade specialties. (More detailed information on the program and on the scope of the examinations is provided in a separate publication, "Bulletin of Information for Candidates" [CE 018 275].) Section I shows the standard scores for both the written tests (designed to measure cognitive skills) and the performance tests (designed to measure manipulative skills) in twenty-six occupations. In Section II sub-scores are given for the three or four subject areas covered by the written tests and for the two parts of the performance tests which separately measure manipulative processes and quality of workmanship as revealed by the end product. Section III provides information in the three following areas: (1) reliability and standard error of measurement for twenty-four of the written tests; (2) a similar analysis for the two new tests on computer technology and building trades maintenance; and (3) a summary of cumulative national norms for both the twenty-six written and performance tests, indicating measures of central tendency, standard deviation, and range of items which have been answered correctly by candidates. (ELG)

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NOCTI TECHNICAL SUPPLEMENT

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CUMULATIVE NATIONAL NORMS

Spring 1974 thru Spring 1978

CUMULATIVE SUB-SCORE NORMS

Fall 1975 thru Spring 1978

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Preface

NOCTI Technical Supplement

This manual contains statistical information related to the NOCTI test series concerned with measurements of occupational competencies in selected trade and technical fields. These exams were constructed after extensive job analyses were performed. The current series cover 26 specialities. The exams for each occupation contain two parts, one concerned with cognitive skills (a written exam) and the other with manipulative skills (a performance test).

The tests are standardized on populations of journeymen. National norms are updated annually. Generally, the tests have high reliability with low Standard Errors of the Measurement. The tests are Content Valid and can be used as Norm Referenced or as Criterion Referenced instruments. Also, the exams have been developed in accordance with the Federal EEOC Employee Selection Standards.

In addition, to overall measures, sub-score norms are reported. The sub-score measures for the written test provide an indication of competency of specific areas of knowledge. The sub-score measures represents materials which have been organized so that they reflect, to a large extent, units of instruction within each field. These measures are helpful in cases where partial credit is being considered, or as a diagnostic tool to identify strengths and weaknesses of a candidate.

The sub-scores and norms for the performance test provide an indication of an individual's skill development in terms of process used and the final product outcome, as applied toward a range of jobs. Competency of experienced workers may be judged by the quality of various end products and the time it takes to complete each job. Standards of end products as well as time are based on actual working conditions.

The exams have been primarily used by colleges responsible for training trade and technical educators. Admission committees use the results of the exams as a measure of requisite occupational competency.

The tests have been designed to reflect fundamental factors within each occupational area. They are based on broad concepts, processes, related knowledge and trade practices. Fundamental trade practices tend not to vary except over long periods of time. The exams were not designed to test understandings of the most current or esoteric aspects of any field. They were designed to ascertain whether or not an individual has had training and/or experience

that would entitle a recognition of accomplishments comparable to those of skilled practitioners in each respective field. When looked at along with other factors, these tests can help to identify occupationally competent workers.

Test Development

The contents of the examinations were derived through occupational analyses, which examined the frequency and importance of specific occupational skills, understandings, and trade knowledge. The analyses were developed by representative trade committees which arrived at consensus of findings and assigned the development of appropriate questions to experts. Additional committee reviews were made prior to pilot testing of the instruments in settings across the United States. The results from pilot testing were analyzed using item analysis and the standard reliability techniques, KR20 and 21. This work was performed at the Instructional Materials Laboratory at Ohio State University. Adjustments in instruments were made and final tests were offered for use, nationally.

Future Measures

Several studies are underway in selected occupational areas which are aimed at establishing student norms for vocational and technical education programs on the secondary and postsecondary levels. These measures will be of use to program administrators for control and planning purposes and as a means of awarding advance credit for work experience.

Leon S. Tunkel
Raymond S. Klein

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LIST OF NOCTI TESTS AND CODES*

TABLE 1

CODE	TEST SERIES
ACON	Air Conditioning and Refrigeration
AIRFR	Airframe and Power Plant
ARCHD	Architectural Drafting
AUTOB	Auto Body Repair
AMECH	Auto Mechanic
BLDTM	Building Trades Maintenance
CMAKE	Cabinet Making and Millwork
CARP	Carpentry
CTECH	Civil Technology
COMTK	Computer Technology
COSMO	Cosmetology
DIENG	Diesel Engine Repair
ESTAL	Electrical Installation
ELCOM	Electronics Communications
IELAN	Industrial Electrician
IERIC	Industrial Electronics
MACHD	Machine Drafting
MACHT	Machine Trades
MASON	Masonry
MECHT	Mechanical Technology
PLUMB	Plumbing
PRINT	Printing
QFOOD	Quantity Food Preparation
SHEET	Sheet Metal
SENGR	Small Engine Repair
WELD	Welding

* A description of the topics covered in each exam is contained in a separate NOCTI publication entitled "Bulletin of Information for Candidates."

SECTION I - Standard Scores

Notes related to Standard Scores

Table 2 - Summary of Standard Scores for 26 NOCTI Written Tests
Table 3 - Summary of Standard Scores for 26 NOCTI Performance Tests

These tables provide test users with both percent scores and standard scores (percentile norms, T score) for 26 written and 26 performance tests. These tables were developed with an N 3262. The tables have been arranged in such a manner that an appropriate standard score can be determined by locating the percent score in either side of the table, and then read across to the appropriate test and column. For standard scores which fall between the measures given, interpolation is required. These standard scores were updated July 1978.

Key

PCT = Percent Score Achieved by Candidate
%/L = National Percentile Rank
T = "T" Score with a mean of 50 and a Standard Deviation of 10
ACON = Code for Air Conditioning and Refrigeration. See Table 1 for complete listing.

The establishment of a cut-score is a matter for each user to determine for themselves. Availability of candidates, fairness, relationship of score to other measures of achievement such as grade point average or supervisory ratings may be helpful in determining a cut-score. A cut score which consistently demonstrates a rate of acceptance between black and white candidates greater than 20 percent, if challenged, may not meet EEOC Standards.

SUMMARY OF STANDARD SCORES FOR 26 NOCTI WRITTEN TESTS

Key:
*PCT = Percent Score Achieved
%L = National Percentile Rank
T = "T" Score with mean of 50 and a standard deviation of 10
ACON = See Table 1 for Names of Tests

	ACON		AIRFR		ARCHD		AUTOB		AMECH		BLDTM		CMAKE		CARP		CTECH		COMTK		COSMO		DIENG		ESTAL		
PCT	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	PCT
100	99	86	99	80	99	86	99	93	99	69	99	80	99	90	99	78	99	89	99	86	99	76	99	79	99	99	100
98	99	83	99	78	99	84	99	90	99	87	99	79	99	88	99	76	99	87	99	84	99	75	99	77	99	99	98
96	99	81	99	76	99	82	99	87	99	84	99	77	99	86	99	74	99	85	99	82	99	73	99	75	99	99	96
94	99	79	99	74	99	80	99	84	99	82	99	75	99	84	99	72	99	84	99	79	99	71	99	73	99	96	94
92	99	77	99	72	99	78	99	81	99	80	99	74	99	82	99	70	99	82	99	77	99	69	99	72	99	94	92
90	99	74	99	70	99	75	99	79	99	78	99	72	99	80	99	67	99	81	99	75	98	67	99	70	99	92	90
88	99	72	99	69	99	73	99	76	99	75	99	70	99	78	97	65	99	79	99	72	97	65	98	68	99	89	88
86	99	70	98	67	99	71	99	73	99	73	99	69	99	76	95	63	99	77	97	70	95	63	97	67	99	87	86
84	99	68	97	65	99	69	99	70	99	71	99	67	99	74	91	61	99	76	95	68	90	61	94	65	99	85	84
82	97	65	95	63	99	67	99	67	99	69	96	66	99	72	84	59	99	74	94	65	87	59	91	63	99	82	82
80	95	63	92	61	97	65	94	65	97	66	92	64	99	70	75	57	99	73	92	63	75	58	88	61	99	80	80
78	90	61	88	59	95	63	91	62	94	64	89	62	98	68	69	55	99	71	89	60	71	56	86	60	99	78	78
76	81	59	85	58	93	61	84	59	90	62	85	61	96	66	59	53	99	69	86	58	60	54	83	58	98	75	76
74	71	57	72	56	90	59	74	56	85	60	82	59	95	64	49	51	99	68	83	56	53	52	76	56	98	73	74
72	64	54	65	54	85	56	61	53	77	57	78	57	89	62	40	49	99	66	66	53	50	50	73	55	98	71	72
70	56	52	59	52	67	54	47	51	69	55	75	56	84	60	34	47	99	65	63	51	38	48	66	53	97	68	70
68	50	50	55	50	55	52	36	48	60	53	66	54	81	58	26	45	99	63	60	49	31	46	60	51	96	66	68
66	37	48	41	48	32	50	28	45	51	51	61	53	78	56	21	43	99	61	50	46	24	44	53	49	90	64	66
64	30	45	36	47	26	48	22	42	43	48	58	51	63	54	17	41	99	60	33	44	20	42	47	48	88	61	64
62	23	43	31	45	23	46	18	39	35	46	55	49	54	52	14	38	93	58	25	41	17	41	38	46	81	59	62
60	16	41	27	43	20	44	14	37	30	44	53	48	44	50	10	36	81	57	16	39	13	39	28	44	77	57	60
58	12	39	24	41	19	42	7	34	23	42	50	46	40	48	7	34	63	55	8	37	12	37	19	43	69	54	58
56	9	36	16	39	18	40	5	31	16	39	44	45	36	46	5	32	52	53	8	34	10	35	11	41	64	52	56
54	8	34	15	37	17	37	2	28	13	37	37	43	25	44	3	30	49	52	7	32	7	33	5	39	55	50	54
52	7	32	13	36	15	35	2	25	9	35	32	41	19	42	3	28	45	50	7	30	6	31	4	37	45	48	52
50	4	30	12	34	13	33	2	23	5	33	27	40	17	40	3	26	39	49	7	27	4	29	4	36	34	45	50
48	3	27	9	32	10	31	2	20	3	30	12	38	15	38	2	24	34	47	7	25	2	27	3	34	29	43	48
46	2	25	5	30	7	29	2	17	2	28	12	36	11	36	2	22	29	45	6	22	1	25	3	32	17	41	46
44	2	23	5	28	5	27	2	14	1	26	11	35	9	34	1	20	26	44	6	20	0	24	3	31	12	38	44
42	1	21	5	26	3	25	2	11	0	24	11	33	6	32	0	19	23	42	6	18	0	22	3	29	7	36	42
40	0	19	4	25	2	23	2	9	0	21	10	32	4	30	0	16	21	41	6	15	0	20	3	27	4	34	40
38	0	16	4	23	2	21	1	6	0	19	10	30	3	28	0	14	18	39	5	13	0	18	2	25	3	31	38
36	0	14	4	21	2	18	1	3	0	17	9	28	1	26	0	12	17	37	5	11	0	16	2	24	1	29	36
34	0	12	4	19	2	16	1	0	0	15	9	27	0	24	0	9	16	36	5	8	0	14	2	22	1	27	34
32	0	10	3	17	2	14	1	0	0	12	8	25	0	22	0	7	15	34	4	6	0	12	2	20	0	24	32
30	0	7	3	15	1	12	1	0	0	10	8	23	0	20	0	5	14	33	4	4	0	10	2	19	0	22	30
28	0	5	3	14	1	10	1	0	0	8	7	22	0	18	0	3	12	31	4	1	0	8	2	17	0	20	28
26	0	3	3	12	1	8	0	0	0	6	7	20	0	16	0	1	11	29	4	0	0	7	2	15	0	17	26
24	0	1	3	10	1	6	0	0	0	3	6	19	0	14	0	0	10	26	3	0	0	5	1	13	0	15	24
22	0	0	2	8	1	4	0	0	0	1	6	17	0	12	0	0	9	26	3	0	0	3	1	12	0	13	22
20	0	0	2	6	0	2	0	0	0	0	5	15	0	10	0	0	8	25	3	0	0	1	1	10	0	10	20
18	0	0	2	4	0	0	0	0	0	0	5	14	0	8	0	0	7	23	2	0	0	0	0	8	0	8	18
16	0	0	2	3	0	0	0	0	0	0	4	12	0	6	0	0	7	21	2	0	0	0	0	7	0	6	16
14	0	0	2	1	0	0	0	0	0	0	4	10	0	4	0	0	6	20	2	0	0	0	0	5	0	3	14
12	0	0	1	0	0	0	0	0	0	0	3	9	0	2	0	0	5	18	2	0	0	0	0	3	0	1	12
10	0	0	1	0	0	0	0	0	0	0	3	7	0	0	0	0	4	17	1	0	0	0	0	1	0	0	10
8	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	0	3	15	1	0	0	0	0	0	0	0	8
6	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	2	14	0	0	0	0	0	0	0	0	6
4	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	2	12	0	0	0	0	0	0	0	0	4
2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	10	0	0	0	0	0	0	0	0	2

NOTE: Read percentage scores, from either extreme left or right hand columns, to appropriate test column to obtain Standard Scores. Interpolation is required for scores falling between any given interval. These Standard Scores are based on approximately 3,250 cases, tested between Spring 1974 and Spring 1978.

TABLE 2

SUMMARY OF STANDARD SCORES for 26 NOCTI WRITTEN TESTS

TABLE 2 - Continued

	ELCOM		IELAN		IERIC		MACHO		MACHT		MASON		MECHT		PLUMB		PRINT		QFOOD		SHEET		SENG		WELD		
PCT	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	PCT
100	99	71	99	79	99	78	99	79	99	93	99	81	99	99	99	99	99	94	99	93	99	77	99	95	99	88	100
98	99	69	99	77	99	76	99	77	99	91	99	78	99	99	99	99	99	93	99	91	99	75	99	92	99	86	98
96	99	68	99	75	99	75	99	75	99	89	99	75	99	99	99	99	99	91	99	89	99	74	99	88	99	84	96
94	99	67	99	73	99	74	99	73	99	87	99	73	99	99	99	98	99	89	99	86	99	72	99	85	99	82	94
92	97	65	99	71	99	72	99	70	99	85	99	70	99	99	99	95	99	87	99	84	98	70	99	81	99	80	92
90	94	64	99	69	99	71	98	68	99	83	99	68	99	99	99	92	99	85	99	82	98	69	99	78	99	78	90
88	92	62	98	67	99	69	97	66	99	81	99	65	99	99	99	90	99	83	99	80	97	67	99	75	99	76	88
86	88	61	98	66	98	68	94	64	99	79	98	62	99	99	99	87	99	82	99	78	97	65	99	71	99	74	86
84	84	60	97	64	97	67	92	62	99	77	90	60	99	99	99	84	99	80	99	75	96	64	99	68	99	72	84
82	77	58	95	62	95	65	85	60	99	75	78	57	99	99	99	82	99	78	99	73	96	62	98	64	99	71	82
80	74	57	83	60	94	64	75	57	99	73	66	54	99	99	99	79	99	76	99	71	91	60	88	61	99	69	80
78	69	56	78	58	92	62	65	55	99	71	53	52	99	99	99	76	99	74	98	69	89	59	75	57	98	67	78
76	64	54	75	56	85	61	60	53	99	69	45	49	99	99	99	74	99	72	97	67	78	57	66	54	95	65	76
74	59	53	65	54	82	60	53	51	98	66	33	46	99	99	98	71	99	71	96	64	75	55	51	51	92	63	74
72	56	52	57	53	79	58	45	49	96	64	21	44	99	99	97	68	99	69	90	62	71	54	38	47	89	61	72
70	47	50	49	51	76	57	39	47	91	62	15	41	99	99	96	66	98	67	83	60	53	52	29	44	78	59	70
68	44	49	39	49	69	56	29	45	86	60	13	39	99	95	92	63	97	65	80	58	46	50	20	40	73	57	68
66	38	48	38	47	61	54	23	42	80	58	12	36	99	91	87	60	96	63	74	55	39	48	17	37	68	55	66
64	34	46	36	45	56	53	18	40	72	56	7	33	99	87	80	58	90	61	61	53	32	47	12	33	61	53	64
62	31	45	26	43	50	51	14	38	63	54	6	31	99	83	70	55	85	59	48	51	25	45	3	30	53	51	62
60	26	44	21	41	46	50	10	36	54	52	3	28	99	79	59	52	81	58	45	49	13	43	2	26	43	49	60
58	22	42	14	40	43	49	6	34	45	50	3	25	99	75	51	50	73	56	39	47	12	42	0	23	38	47	58
56	17	41	11	38	40	47	5	32	40	48	2	23	99	71	37	47	69	54	31	44	11	40	0	20	32	45	56
54	15	40	10	36	35	46	3	29	33	46	2	20	99	67	31	44	55	52	24	42	10	38	0	18	27	43	54
52	11	38	9	34	30	44	2	27	28	44	1	18	99	63	22	42	47	50	16	40	8	37	0	13	20	41	52
50	11	37	7	32	25	43	1	25	20	42	1	15	99	59	15	39	36	48	11	38	7	35	0	9	17	39	50
48	10	35	4	30	22	42	0	23	17	40	0	12	66	55	11	36	29	47	8	36	7	33	0	6	14	36	48
46	8	34	3	29	19	40	0	21	13	38	0	10	58	51	7	34	24	45	6	33	6	32	0	2	12	36	46
44	7	33	3	27	15	39	0	19	10	35	0	7	50	47	3	31	20	43	5	31	6	30	0	0	5	34	44
42	5	31	2	25	13	37	0	17	6	33	0	4	41	43	2	28	18	41	4	29	6	28	0	0	4	32	42
40	4	30	2	23	11	36	0	14	2	31	0	2	33	39	2	26	15	39	3	27	6	27	0	0	3	30	40
38	4	29	2	21	9	35	0	12	2	29	0	0	31	35	1	23	12	37	2	25	5	25	0	0	2	28	38
36	4	27	1	19	7	33	0	10	1	27	0	0	30	31	0	20	10	36	2	22	5	23	0	0	1	26	36
34	3	26	0	17	6	32	0	8	1	25	0	0	29	26	0	18	9	34	2	20	5	22	0	0	0	24	34
32	3	25	0	16	5	31	0	6	1	23	0	0	26	22	0	15	9	32	2	18	5	20	0	0	0	22	32
30	3	23	0	14	2	29	0	4	0	21	0	0	25	18	0	12	7	30	2	16	4	18	0	0	0	20	30
28	3	22	0	12	0	28	0	1	0	19	0	0	23	14	0	10	5	28	2	14	4	17	0	0	0	18	28
26	2	21	0	10	0	26	0	0	0	17	0	0	21	10	0	7	2	26	1	11	4	15	0	0	0	16	26
24	2	19	0	8	0	25	0	0	0	15	0	0	20	6	0	4	0	25	1	9	3	13	0	0	0	14	24
22	2	18	0	6	0	24	0	0	0	13	0	0	18	2	0	2	0	23	1	7	3	11	0	0	0	12	22
20	2	17	0	4	0	22	0	0	0	11	0	0	17	0	0	0	0	21	1	5	3	10	0	0	0	10	20
18	2	15	0	3	0	21	0	0	0	9	0	0	15	0	0	0	0	19	0	3	3	8	0	0	0	8	18
16	2	14	0	1	0	19	0	0	0	7	0	0	13	0	0	0	0	17	0	0	2	6	0	0	0	6	16
14	1	13	0	0	0	18	0	0	0	4	0	0	12	0	0	0	0	15	0	0	2	5	0	0	0	4	14
12	1	11	0	0	0	17	0	0	0	2	0	0	10	0	0	0	0	13	0	0	2	3	0	0	0	3	12
10	0	10	0	0	0	15	0	0	0	0	0	0	8	0	0	0	0	12	0	0	1	1	0	0	0	1	10
8	0	9	0	0	0	14	0	0	0	0	0	0	7	0	0	0	0	10	0	0	1	0	0	0	0	0	8
6	0	7	0	0	0	13	0	0	0	0	0	0	5	0	0	0	0	8	0	0	0	0	0	0	0	0	6
4	0	6	0	0	0	11	0	0	0	0	0	0	3	0	0	0	0	6	0	0	0	0	0	0	0	0	4
2	0	4	0	0	0	10	0	0	0	0	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0	2

SUMMARY OF STANDARD SCORES FOR 26 NOCTI PERFORMANCE TESTS

Key:
PCT = Percent Score Achieved
%L = National Percentile Rank
T = "T" Score with mean of 50 and a standard deviation of 10
ACON = See Table 1 for Names of Tests

	ACON		AIRFR		ARCHD		AUTOB		AMECH		BLDTM		CMAKE		CARP		CTECH		COMTK		COSMO		DIENG		ESTAL		
PCT	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	PCT
100	99	62	99	60	99	62	99	63	99	64	99	65	99	62	99	67	99	61	99	61	99	66	99	64	99	64	100
98	98	60	92	59	99	61	95	61	98	63	99	63	98	61	97	66	95	60	90	58	97	64	97	62	97	63	98
96	90	59	87	57	98	60	85	60	94	61	94	61	94	60	94	65	90	59	80	56	92	63	89	61	93	62	96
94	85	58	84	56	97	59	78	58	89	60	83	59	80	59	91	64	86	58	64	53	88	61	78	59	89	61	94
92	79	56	76	54	94	58	68	56	84	59	72	57	69	58	87	63	83	58	41	51	81	60	73	58	83	60	92
90	74	55	64	53	79	57	61	54	77	58	65	55	66	56	84	62	81	57	37	48	77	58	70	56	75	59	90
88	60	54	52	51	67	56	49	52	71	56	62	53	62	55	81	61	79	56	34	46	72	57	63	55	71	58	88
86	52	52	35	50	63	55	44	51	64	55	59	51	60	54	77	60	76	55	30	44	70	55	59	53	68	57	86
84	42	51	23	48	58	54	39	49	57	54	56	49	56	53	75	59	74	55	27	41	65	53	51	51	64	56	84
82	38	50	22	47	55	54	35	47	50	52	53	47	47	52	73	58	71	54	22	39	56	52	45	50	61	55	82
80	32	48	21	46	52	53	29	45	46	51	50	45	45	51	70	57	69	53	16	36	50	50	40	48	55	54	80
78	28	47	20	44	44	52	27	43	40	50	44	43	42	50	68	56	66	52	14	34	39	49	37	47	51	53	78
76	25	46	18	43	42	51	23	42	37	49	39	41	38	48	65	55	63	51	11	31	32	47	32	45	47	52	76
74	23	44	17	41	38	50	19	40	32	47	33	39	36	47	63	54	57	51	9	29	30	46	27	44	46	51	74
72	15	43	16	40	34	49	14	38	28	46	32	37	32	46	60	53	47	50	8	26	25	44	24	42	44	50	72
70	11	41	15	38	31	48	9	36	25	45	31	35	27	45	55	52	37	49	8	24	22	43	21	40	40	49	70
68	9	40	14	37	28	47	7	34	21	43	30	33	20	44	54	51	35	48	7	21	18	41	14	39	37	48	68
66	8	39	13	35	26	46	6	33	19	42	29	31	19	43	52	50	32	48	7	19	16	39	12	37	35	47	66
64	8	37	12	34	20	45	4	31	17	41	29	29	19	41	49	49	30	47	7	16	11	38	9	36	32	46	64
62	7	36	11	32	19	44	4	29	16	40	28	28	18	40	46	48	27	46	7	14	10	36	7	34	29	45	62
60	7	35	10	31	19	43	3	27	13	38	27	26	17	39	43	47	25	45	7	11	7	35	6	33	25	44	60
58	6	33	9	29	18	42	2	25	11	37	26	24	16	38	39	46	24	45	6	9	5	33	6	31	23	43	58
56	5	32	9	28	17	41	2	24	9	36	25	22	15	37	34	45	24	44	6	7	4	32	5	29	21	42	56
54	5	31	8	26	14	40	1	22	8	34	24	20	14	36	31	44	23	43	6	4	3	30	5	28	19	41	54
52	5	29	7	25	13	39	0	20	7	33	23	18	12	34	28	43	23	42	6	2	3	28	4	26	17	40	52
50	5	28	7	23	12	38	0	18	6	32	22	16	11	33	25	42	22	41	5	0	2	27	4	25	16	39	50
48	4	27	6	22	12	37	0	16	5	31	21	14	10	32	21	41	21	41	5	0	2	25	3	23	15	38	48
46	4	25	5	20	11	37	0	14	5	29	21	12	9	31	18	40	21	40	5	0	2	24	0	22	14	37	46
44	4	24	5	19	11	36	0	13	4	28	20	10	7	30	16	39	20	39	5	0	1	22	0	20	13	36	44
42	4	22	5	17	10	35	0	11	3	27	19	8	6	29	14	38	20	38	5	0	1	21	0	18	13	35	42
40	4	21	4	16	10	34	0	9	2	25	18	6	5	27	11	37	19	38	4	0	0	19	0	17	9	34	40
38	3	20	4	14	9	33	0	7	2	24	17	4	2	26	9	36	18	37	4	0	0	17	0	15	6	33	38
36	2	18	4	13	9	32	0	5	2	23	16	2	2	25	6	35	18	36	4	0	0	16	0	14	5	32	36
34	2	17	4	11	8	31	0	4	2	22	15	0	2	24	5	34	17	35	4	0	0	14	0	12	4	31	34
32	0	16	4	10	8	30	0	2	1	20	14	0	2	23	4	33	17	34	4	0	0	13	0	11	3	30	32
30	0	14	3	8	7	29	0	0	0	19	13	0	2	22	3	32	16	34	3	0	0	11	0	9	3	29	30
28	0	13	3	7	6	28	0	0	0	18	12	0	1	20	3	31	15	33	3	0	0	10	0	7	1	28	28
26	0	12	3	5	5	27	0	0	0	16	12	0	1	19	2	30	15	32	3	0	0	8	0	6	1	27	26
24	0	10	3	4	5	26	0	0	0	15	11	0	1	18	1	29	14	31	3	0	0	6	0	4	1	26	24
22	0	9	2	2	4	25	0	0	0	14	10	0	1	17	1	28	14	31	2	0	0	5	0	3	1	25	22
20	0	8	2	1	4	24	0	0	0	13	9	0	1	16	0	27	13	30	2	0	0	3	0	1	1	24	20
18	0	6	2	0	4	23	0	0	0	11	8	0	0	15	0	27	12	29	2	0	0	2	0	0	1	23	18
16	0	5	2	0	4	22	0	0	0	10	7	0	0	14	0	26	11	28	2	0	0	0	0	0	0	22	16
14	0	4	2	0	3	21	0	0	0	9	6	0	0	12	0	25	10	27	2	0	0	0	0	0	0	21	14
12	0	2	1	0	3	20	0	0	0	7	5	0	0	11	0	24	8	27	1	0	0	0	0	0	0	20	12
10	0	1	1	0	3	20	0	0	0	6	4	0	0	10	0	23	7	26	1	0	0	0	0	0	0	19	10
8	0	0	0	0	2	19	0	0	0	5	4	0	0	9	0	22	6	25	0	0	0	0	0	0	0	18	8
6	0	0	0	0	2	18	0	0	0	4	3	0	0	8	0	21	4	24	0	0	0	0	0	0	0	17	6
4	0	0	0	0	2	17	0	0	0	2	2	0	0	7	0	20	3	24	0	0	0	0	0	0	0	16	4
2	0	0	0	0	0	16	0	0	0	1	0	0	0	5	0	19	1	23	0	0	0	0	0	0	0	15	2

TABLE 3

NOTE: Read percentage scores, from either extreme left or right hand columns, to appropriate test column to obtain Standard Scores. Interpolation is required for scores falling between any given interval. These Standard Scores are based on approximately 3,250 cases, tested between Spring 1974 and Spring 1978.

SUMMARY OF STANDARD SCORES FOR 26 NOCTI PERFORMANCE TESTS

TABLE 3 - Continued

	ELCOM		IELAN		IERIC		MACHD		MACHT		MASON		MECHT		PLUMB		PRINT		QFOOD		SHEET		SENG		WELD		
PCT	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	%L	T	PCT
100	99	59	99	65	99	62	99	65	99	66	99	61	99	65	99	65	99	65	99	61	99	61	99	64	99	63	100
98	93	58	93	63	95	61	99	64	99	65	95	60	99	64	99	64	97	64	96	60	97	60	98	63	97	62	98
96	82	57	90	62	90	60	98	63	97	64	86	58	99	63	97	63	93	63	87	59	93	59	95	62	90	61	96
94	76	56	87	60	84	59	96	61	95	63	79	57	99	62	94	62	87	61	78	58	88	57	92	61	85	59	94
92	63	55	84	58	79	59	91	60	92	62	69	56	99	62	91	60	83	60	72	57	83	56	85	59	79	58	92
90	55	54	77	57	73	58	82	59	87	61	60	55	97	61	88	59	81	58	68	56	70	55	75	58	75	57	90
88	50	53	67	55	65	57	77	58	82	60	54	53	96	60	83	58	75	57	65	55	58	54	70	57	71	56	88
86	40	52	64	54	63	56	70	56	79	59	51	52	94	59	79	57	69	56	60	54	47	53	67	55	63	55	86
84	33	50	52	52	60	55	64	55	74	58	41	51	93	58	71	55	62	54	55	53	37	52	60	54	59	54	84
82	30	49	44	51	57	54	60	54	70	57	32	50	91	57	66	54	54	53	51	52	36	51	51	53	54	53	82
80	26	48	40	49	52	53	50	52	66	56	26	48	90	57	55	53	48	52	43	51	35	50	46	52	45	52	80
78	23	47	35	48	47	52	44	51	63	55	25	47	88	56	52	52	45	50	38	50	34	48	41	50	41	51	78
76	20	46	32	46	44	52	37	50	61	54	20	46	86	55	47	50	41	49	36	49	32	47	40	49	38	50	76
74	19	45	29	45	42	51	36	49	57	53	19	45	85	54	36	49	38	47	34	48	31	46	37	48	37	49	74
72	18	44	25	43	39	50	33	47	56	52	18	43	83	53	29	48	34	46	30	47	29	45	32	47	31	48	72
70	18	43	22	42	37	49	30	46	52	51	18	42	82	53	24	47	30	45	28	46	27	44	31	45	29	46	70
68	16	42	18	40	36	48	28	45	46	50	17	41	80	52	18	46	27	43	25	45	26	43	30	44	25	45	68
66	14	40	15	39	34	47	24	44	43	49	17	40	79	51	18	44	23	42	21	44	23	42	27	43	24	44	66
64	13	39	11	37	33	46	20	42	39	48	16	38	77	50	17	43	22	41	15	43	20	41	24	41	22	43	64
62	12	38	8	36	31	45	17	41	37	47	15	37	75	49	16	42	19	39	14	42	17	39	22	40	19	42	62
60	11	37	6	34	25	45	15	40	31	46	15	36	74	49	16	41	16	38	13	42	14	38	19	39	18	41	60
58	8	36	6	33	25	44	14	38	29	45	14	35	72	48	15	39	13	36	13	41	12	37	14	38	16	40	58
56	8	35	5	31	24	43	13	37	27	44	14	34	71	47	14	38	9	35	12	40	11	36	10	36	14	39	56
54	8	34	5	30	23	42	11	36	25	43	13	32	69	46	13	37	7	34	11	39	11	35	8	35	12	38	54
52	8	33	3	28	20	41	10	35	23	42	13	31	68	45	11	36	5	32	10	38	11	34	8	34	11	37	52
50	7	31	3	27	19	40	7	33	22	41	12	30	66	44	10	35	4	31	10	37	10	33	7	33	10	36	50
48	7	30	3	25	18	39	6	32	19	40	12	29	32	44	8	33	3	30	9	36	10	32	7	31	9	34	48
46	6	29	2	24	16	39	5	31	17	39	11	27	31	43	6	32	2	28	9	35	10	30	5	30	9	33	46
44	6	28	2	22	15	38	3	30	14	38	2	26	30	42	6	31	1	27	9	34	9	29	4	29	7	32	44
42	6	27	2	21	15	37	2	28	13	37	2	25	28	41	5	30	0	25	8	33	9	28	3	27	6	31	42
40	5	26	2	19	14	36	2	27	10	36	2	24	27	40	5	28	0	24	7	32	9	27	3	26	5	30	40
38	5	25	1	18	12	35	2	26	9	35	2	22	26	40	4	27	0	23	7	31	8	26	2	25	4	29	38
36	4	24	1	16	12	34	1	24	6	34	2	21	24	39	4	26	0	21	7	30	8	25	2	24	3	28	36
34	4	23	0	15	11	33	1	23	4	33	2	20	23	38	4	25	0	20	7	29	5	24	1	22	3	27	34
32	3	21	0	13	7	32	1	22	4	32	1	19	22	37	3	23	0	19	6	28	4	23	0	21	3	26	32
30	3	20	0	11	6	32	1	21	3	31	1	17	20	36	3	22	0	17	6	27	4	21	0	20	3	25	30
28	3	19	0	10	5	31	1	19	2	30	1	16	19	36	2	21	0	16	6	26	3	20	0	19	3	24	28
26	2	18	0	8	4	30	1	18	2	26	1	15	18	35	2	20	0	14	6	25	3	19	0	17	2	23	26
24	2	17	0	7	3	29	1	17	1	27	1	14	16	34	2	19	0	13	6	24	3	18	0	16	2	21	24
22	2	16	0	5	3	28	0	15	1	26	1	12	15	33	2	17	0	12	6	23	3	17	0	15	2	20	22
20	1	15	0	4	2	27	0	14	1	25	0	11	13	32	2	16	0	10	5	22	2	16	0	13	1	19	20
18	0	14	0	2	2	26	0	13	0	24	0	10	12	32	1	15	0	9	4	21	2	15	0	12	0	18	18
16	0	12	0	1	1	25	0	12	0	23	0	9	11	31	1	14	0	8	3	20	2	14	0	11	0	17	16
14	0	11	0	0	0	25	0	10	0	22	0	7	9	30	1	12	0	6	2	19	2	12	0	10	0	16	14
12	0	10	0	0	0	24	0	9	0	21	0	6	8	29	1	11	0	5	2	18	1	11	0	8	0	15	12
10	0	9	0	0	0	23	0	8	0	20	0	5	7	28	0	10	0	3	1	17	1	10	0	7	0	14	10
8	0	8	0	0	0	22	0	7	0	19	0	4	5	27	0	9	0	2	1	17	0	9	0	6	0	13	8
6	0	7	0	0	0	21	0	5	0	18	0	3	4	27	0	7	0	1	1	16	0	8	0	4	0	12	6
4	0	6	0	0	0	20	0	4	0	17	0	1	3	26	0	6	0	0	0	15	0	7	0	3	0	11	4
2	0	5	0	0	0	19	0	3	0	16	0	0	1	25	0	5	0	0	0	14	0	6	0	2	0	9	2

SECTION II - Sub Scores

Notes related to Sub-Score Norms

Table 4 - National Norms for Sub-Scores on 26 Written Tests
Table 5 - National Norms for Sub-Scores on 26 Performance Tests
Table 6 - Topical Headings for Sub-Scores on Written Test by Occupational Areas

The Norms for each test are presented in tables organized in the following manner:

Written Tests

- With one exception, each written test in the series of 26 tests has been divided into 4 categories (one has only 3); *
- An outline of what each category represents is provided in Table 6;
- A more complete description of the content of each test may be found in another NOCTI publication, Bulletin of Information for Candidates.

Performance Tests

- Each performance test has been divided into two categories; one is concerned with manipulative processes; the other relates to the quality of workmanship as revealed by the end product.**
- A detailed description of the areas covered by the performance test may be found in the Bulletin of Information for Candidates.

Universities, colleges and other institutions may obtain specific sub-score percentile norms and T scores for candidates by requesting the information from NOCTI. In the future, as demand warrants, a supplement to this bulletin will contain these data.

* Sub-Score Norms of BLDTM and COMTK Written tests are not currently available.

** Sub-Score Norms of COMTK Performance tests are not currently available.

TABLE 4

NATIONAL NORMS FOR SUB-SCORES ON WRITTEN TESTS

KEY: *A,B,C,D - Refers to topical Sub Headings which are presented following these tables.

GROUP	# OF CAN		# OF ITEMS	% CORRECT MIN	MAX	% MEAN	STD.% DEV.	STD.% ERR.	MEDIAN %
ACON	90	A	25	20	92	73.8	11.4	1.2	56
		B	58	36	90	69.3	11.0	1.2	63
		C	56	29	82	61.0	9.9	1.0	55
		D	26	15	88	54.4	17.0	1.8	51
AIRFR	10	A	40	27	85	54.5	24.6	7.8	56
		B	84	24	79	51.4	21.1	6.7	51
		C	59	19	75	49.3	23.7	7.5	47
ARCHD	18	A	34	35	100	64.7	25.2	5.9	67
		B	32	47	94	72.9	12.4	2.9	70
		C	52	13	79	45.1	21.4	5.0	46
		D	32	41	78	57.3	11.4	2.7	59
AUTOB	62	A	61	51	84	68.9	8.4	1.1	67
		B	37	35	92	67.0	10.5	1.3	63
		C	40	17	88	68.3	13.3	1.7	52
		D	12	8	100	69.2	21.2	2.7	54
AMECH	336	A	40	40	92	71.7	10.0	.5	66
		B	60	30	87	62.4	11.3	.6	58
		C	70	30	86	63.7	9.3	.5	58
		D	30	10	90	54.3	13.1	.7	50
BLDTM	0		0	0	0	.0	.0	.0	50
			0	0	0	.0	.0	.0	50
			0	0	0	.0	.0	.0	50
			0	0	0	.0	.0	.0	50
CMAKE	43	A	37	24	73	54.5	12.3	1.9	48
		B	66	48	88	67.9	10.6	1.6	68
		C	33	27	82	58.1	9.7	1.5	54
		D	24	42	96	64.0	13.5	2.1	69
CARP	209	A	39	31	92	75.8	11.1	.8	61
		B	36	31	100	73.9	12.3	.9	65
		C	32	34	97	70.8	13.1	.9	65
		D	52	23	94	72.4	10.6	.7	58
CTECH	4	A	53	30	60	42.5	12.6	6.4	45
		B	30	37	70	54.2	13.7	6.9	53
		C	29	14	62	38.8	23.5	11.7	38
		D	40	35	50	41.2	7.5	3.8	42
COMTK	0		0	0	0	.0	.0	.0	50
			0	0	0	.0	.0	.0	50
			0	0	0	.0	.0	.0	50
			0	0	0	.0	.0	.0	50
COSMO	122	A	15	13	87	54.2	16.9	1.5	50
		B	50	20	90	65.4	17.8	1.6	55
		C	33	21	91	69.5	16.7	1.5	56
		D	22	9	91	65.2	21.1	1.9	50
DIENG	29	A	40	65	95	82.8	7.5	1.4	80
		B	32	22	88	55.9	15.9	2.9	55
		C	42	31	83	58.8	11.6	2.1	57
		D	53	21	91	58.8	14.7	2.7	56

TABLE 4 - CONTINUED

NATIONAL NORMS FOR SUB-SCORES ON WRITTEN TESTS

GROUP	# OF CAN.		# OF ITEMS	% CORRECT MIN	MAX	% MEAN	STD. % DEV.	STD. % ERR.	MED- IAN %
ESTAL	57	A	37	10	95	50.0	16.4	2.2	55
		B	37	14	81	51.0	12.8	1.7	47
		C	39	21	82	50.5	14.9	2.0	51
		D	64	17	81	52.6	13.3	1.8	49
ELCOM	59	A	26	27	96	68.2	18.4	2.4	61
		B	27	15	93	55.1	22.3	2.9	54
		C	50	14	96	57.2	24.1	3.1	55
		D	27	7	93	55.7	25.0	3.3	50
IELAN	44	A	20	35	95	79.4	14.6	2.2	65
		B	60	27	85	69.1	13.1	2.0	56
		C	60	28	85	65.5	12.2	1.8	56
		D	60	32	95	64.8	15.8	2.4	63
IERIC	50	A	35	9	86	55.0	21.7	3.1	47
		B	65	20	82	53.2	18.7	2.6	51
		C	15	7	100	50.7	22.9	3.2	53
		D	35	17	80	54.5	19.3	2.7	48
MACHD	97	A	45	16	96	69.9	16.1	1.6	56
		B	23	17	91	69.1	16.3	1.7	54
		C	47	13	91	60.9	16.1	1.6	52
		D	20	15	100	75.7	17.1	1.7	57
MACHT	189	A	25	20	84	54.1	12.3	.9	52
		B	72	15	75	54.9	11.5	.8	45
		C	46	22	85	61.9	13.0	.9	53
		D	17	18	82	57.8	11.2	.8	50
MASON	34	A	28	14	89	58.6	22.9	3.9	51
		B	28	29	93	66.9	18.3	3.1	61
		C	29	24	83	56.6	18.2	3.1	53
		D	15	33	87	67.6	16.3	2.8	69
MECHT	2	A	20	35	55	45.0	14.1	10.0	45
		B	9	33	44	38.9	7.9	5.6	36
		C	8	25	50	37.5	17.7	12.5	37
		D	30	33	57	45.0	16.5	11.7	45
PLUMB	48	A	86	38	74	57.6	9.0	1.3	56
		B	24	33	79	56.1	10.3	1.5	56
		C	21	33	81	59.3	12.3	1.8	57
		D	36	31	67	46.6	8.6	1.2	49
PRINT	81	A	45	36	82	60.2	10.0	1.1	59
		B	40	25	67	42.4	10.4	1.2	46
		C	31	23	87	58.0	12.3	1.4	55
		D	15	20	93	59.1	13.9	1.5	56
QFOOD	51	A	29	14	83	55.4	18.2	2.6	48
		B	46	22	78	50.7	13.6	1.9	50
		C	53	23	75	52.9	13.4	1.9	49
		D	69	29	80	58.8	13.0	1.8	54
SHEET	21	A	23	17	87	62.1	18.7	4.1	52
		B	58	38	90	62.6	14.3	3.1	64
		C	17	18	76	57.7	15.9	3.5	47
		D	14	14	86	62.2	18.4	4.0	50
SENGR	37	A	19	37	89	63.2	15.9	2.6	63
		B	69	16	84	61.0	19.7	3.2	50
		C	30	10	93	63.0	24.6	4.0	51
		D	47	19	87	58.2	20.7	3.4	53
WELD	97	A	60	27	87	63.5	11.6	1.2	57
		B	35	31	86	61.9	12.5	1.3	58
		C	35	23	74	51.5	13.3	1.3	48
		D	25	20	88	57.7	13.5	1.4	54

TABLE 5

NATIONAL NORMS FOR SUB-SCORES ON PERFORMANCE TESTS

GROUP *	# OF CAN	# OF ITEMS **	% CORRECT MIN	% CORRECT MAX	PERCENT MEAN	PERCENT STD. DEV.	PERCENT STD. ERR.	PERCENT MEDIAN
ACON	80	140	6	100	83.8	16.0	1.8	88
	79	60	30	100	82.5	14.6	1.6	85
AIRFR	9	310	41	97	86.5	17.3	5.8	89
	9	220	52	98	84.8	13.6	4.5	88
ARCHD	19	100	6	97	71.1	23.6	5.4	70
	19	120	4	90	64.3	24.7	5.7	68
AUTOB	62	160	51	100	87.5	9.9	1.3	89
	62	55	36	100	87.4	10.3	1.3	87
AMECH	314	138	17	100	77.6	16.5	.9	81
	315	229	21	100	78.6	16.4	.9	83
BLDTM	6	415	72	98	83.8	10.4	4.2	82
	6	300	76	97	86.6	10.5	4.3	78
CMAKE	39	335	47	99	85.8	10.8	1.7	85
	39	90	46	100	82.5	13.8	2.2	83
CARP	199	60	32	100	73.2	17.5	1.2	73
	200	60	38	100	73.5	17.0	1.2	73
CTECH	3	244	41	94	60.0	29.7	17.2	41
	3	157	36	97	56.3	35.1	20.3	36
COMTK	0	0	0	0	.0	.0	.0	36
	0	0	0	0	.0	.0	.0	36
COSMO	86	110	45	100	81.1	11.8	1.3	82
	85	12	8	100	64.5	25.7	2.8	58
DIENG	28	100	49	100	82.4	13.3	2.5	81
	28	100	48	99	82.8	13.1	2.5	84
ESTAL	54	285	16	100	80.3	19.4	2.6	86
	54	180	13	100	77.9	21.7	3.0	86
ELCOM	54	445	17	100	81.8	18.0	2.4	88
	51	215	15	100	80.2	23.4	3.3	90
IELAN	42	84	40	100	82.4	14.4	2.2	85
	44	66	27	100	78.9	16.3	2.5	82
IERIC	44	390	24	100	74.9	18.9	2.8	80
	44	50	10	100	63.5	22.9	3.5	62
MACHD	87	40	55	100	87.6	11.1	1.2	88
	89	90	41	98	76.5	11.1	1.2	77
MACHT	184	85	2	98	65.4	20.0	1.5	64
	183	80	10	99	69.7	18.9	1.4	72
MASON	34	100	43	100	81.6	16.1	2.8	85
	34	25	20	100	74.4	20.3	3.5	76
MECHT	2	125	61	90	75.6	20.9	14.8	61
	2	100	34	94	64.0	42.4	30.0	34
PLUMB	45	80	13	100	76.6	17.3	2.6	77
	45	45	11	100	74.6	20.6	3.1	80
PRINT	78	85	41	100	79.2	15.1	1.7	81
	78	75	40	100	80.5	15.0	1.7	84
QFOOD	49	470	57	100	83.9	12.7	1.8	86
	49	100	41	100	81.5	11.3	1.6	81
SHEET	18	80	42	100	83.6	17.7	4.2	90
	18	80	29	100	79.0	21.3	5.0	85
SENGR	36	160	44	99	76.2	15.0	2.5	76
	36	110	45	99	78.8	13.8	2.3	80
WELD	93	130	37	100	86.9	12.2	1.3	90
	93	177	7	100	68.0	22.6	2.3	72

* Data for each occupation are presented in two sets - upper set = process measure; lower set = product measure

**No. of Items = Maximum Raw Score

TABLE 6

HEADINGS FOR SUB SCORES ON WRITTEN TEST BY OCCUPATIONAL AREAS

(See Bulletin of Information for Candidates for descriptive details)

SCOPE OF AIR CONDITIONING AND REFRIGERATION

A. Domestic Systems Installation
B. Commercial System Installation
C. Residential Air Conditioning and Heating Installation
D. Industrial Refrigeration Installation and Servicing

SCOPE OF AIRFRAME AND POWER PLANT

A. General
B. Airframe - Systems and Components
C. Power Plant Operation and Maintenance: Systems and Components

SCOPE OF ARCHITECTURAL DRAFTING

A. Basic Architectural Data
B. Planning and Design
C. Materials and Methods of Construction
D. Structural Systems; Administration

SCOPE OF AUTO BODY REPAIR

A. Welding
B. Sheet Metal Repair; Refinishing
C. Glass: Trim and Hardware; Panel Sections; Frame Alignment
D. Electrical Circuits; Estimating; Safety

SCOPE OF AUTO MECHANICS

A. Basic Shop Principles & Practices; Engines
B. Emission Systems; Fuel Systems; Electrical
C. Engine System Analysis and Repair; Suspension; Steering and Braking
D. Accessories; Shop Management and Control

SCOPE OF BUILDING TRADES MAINTENANCE

A. Heating, Air Conditioning, Refrigeration and Carpentry
B. Masonry, Floor Care and Electrical
C. Painting, Wallpapering and Plumbing
D. Management Practices, Sheet Metal and Welding

SCOPE OF CABINET MAKING AND MILLWORK

A. Planning; Safety; Wood/Stock Selection
B. Machines; Hand Tools
C. Joinery; Assembly
D. Finishing

SCOPE OF CARPENTRY

A. Surveying, Layout, and Blueprint Reading; Foundation Work
B. Wall and Ceiling Framing; Roof Framing and Roofing
C. Stair Construction; Interior and Exterior Finish
D. Estimating; Scaffolding; Cabinetry

SCOPE OF CIVIL TECHNOLOGY

A. Asphalt; Soil; Concrete
B. Surveying
C. Steel Structures; General Engineering Information
D. Drafting; Instrumentation

SCOPE OF COMPUTER TECHNOLOGY

A. Operations; Systems and Analysis
B. Data Processing
C. Computer Programming
D. Systems Analysis and Design

SCOPE OF COSMETOLOGY

A. Care of Hands and Feet; Facial Treatments
B. Shampoos and Colorless Rinses; Haircoloring
C. Hair Styling; Care of Hair and Scalp
D. Permanent Waving; Hair Pieces; Hair Shaping

SCOPE OF DIESEL ENGINE REPAIR

A. Basic Engine Diagnosis and Repair
B. Electrical Systems Diagnosis and Repair
C. Fuel Injection Pumps and Nozzle Repair and Adjustment
D. Hydraulic Systems Troubleshooting and Repair

SCOPE OF ELECTRICAL INSTALLATION

A. Basic Principles of Electricity and Magnetism
B. Reading of Working Instructions; NEC
C. Principles of Operation and Installation of Controls and Rotating Equipment; Electronics Installation
D. Electric Power Residential, Commercial

SCOPE OF ELECTRONICS COMMUNICATIONS

A. Basic Electricity
B. AM & FM Inductive Devices; Alternating Current
C. Amplifiers; Electronic Circuits
D. Measurements, Standards and Tolerances

TABLE 6

SCOPE OF INDUSTRIAL ELECTRICIAN

A. Basic Electricity and Electronics
B. Testing, Maintenance and Repair of Electric Power Equipment
C. Power Generation and Distribution
D. Motors and Controls

SCOPE OF INDUSTRIAL ELECTRONICS

A. Basic Electronic Components
B. Amplifiers, Circuits, Energy Conversion
C. Digital Circuits; Computer Technology
D. Instruments; Troubleshooting

SCOPE OF MACHINE DRAFTING

A. Orthographic Projection and Pictorial Drawings
B. Related Mathematical Computations
C. Machined Parts; Manufacturing Processes
D. Instruments; Equipment

SCOPE OF MACHINE TRADES

A. Layout and Inspection; Materials Treatment
B. Milling, Turning, Shaping and Planning
C. Machine Attachments; Controls
D. Science; Trade Computations

SCOPE OF MASONRY

A. Terminology; Materials of the Trade
B. Estimating Procedures; Layout Procedures
C. Masonry Practices
D. Trade Tools; Safety

SCOPE OF MECHANICAL TECHNOLOGY

A. Machine Tool Operations; Metallurgy
B. Statics; Fluid Mechanics; Thermodynamic
C. Electricity; Strength of Materials
D. Physics; Mathematics; Computer

SCOPE OF PLUMBING

A. Operating Principles and Installation
B. Water Supply and Distribution
C. Plumbing Fixtures; Industrial Wastes
D. Inspection and Tests

SCOPE OF PRINTING

A. Design; Composition
B. Photo-Preparatory; Image-Carriers
C. Image Transfer
D. Finishing

SCOPE OF QUANTITY FOOD PREPARATIONS

A. Appetizers; Soups; Salads
B. Meats; Poultry; Seafoods; Vegetables
C. Baking; Buffet, Lunch and Breakfast
D. Equipment; Administration

SCOPE OF SHEET METAL

A. Layout and Drafting; Computations
B. Sheet Metal Machinery; Tools; Process
C. Welding; Hazards; Fluxes
D. Materials; Building Code and Regulations

SCOPE OF SMALL ENGINE REPAIR

A. Testing and Inspection; Maintenance
B. Lubrication; Engine Systems; Fuel, Electrical, Cooling and Power
C. Block Servicing; Troubleshooting
D. Engine Operation; Computations

SCOPE OF WELDING

A. Brazing; Oxy-Acetylene; Resistance Welding
B. Arc Welding
C. Symbols; Inspection and Defects
D. Joint Design; Procedure Qualifications

SECTION III - Other Measures

Notes Related to Reliability, New Tests and Cumulative National Norms

Table 7 - Reliability and Standard Error of the Measurements for NOCTI Written Tests

Table 8 - Item Analysis of New Tests

Table 9 - Cumulative National Norms, Spring 1974 thru Spring 1978.

- Table 7 provides a summary of measures of reliability KR20 and 21 including the standard errors of the measurement for the original 24 test sample. In general, these measures reflect high indicators of reliability with low error terms.
- Table 8 provides a similar summary for two new tests, Computer Technology and Building Trades Maintenance.
- Table 9 is a summary of Cumulative National Norms for both the 26 written and performance tests. Measures of central tendency, standard deviation and the range of items which have received correct responses by candidates is included. To translate percent scores to standard scores refer to Tables 2 and 3.

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Reliability and Standard Error Measurement of NOCTI Written Test Scores – TABLE 7

(Developmental Measures)

Examination	N	Med	Mean	Std Dev	KR20	SEKR20	KR21	SEKR21
Air Conditioning	49	100	100	17.5	.907	5.34	.875	6.19
Airframe & Power	13	113	117.7	21.2	.932	5.53	.902	6.64
Architectural Drafting	58	90	91	13.4	.861	4.99	.809	5.86
Auto Body Repair	57	101	98.3	14.9	.890	4.94	.855	5.67
Auto Mechanic	78	136	132	18.8	.913	5.55	.878	6.57
Cabinet Making	23	94	90.1	20.4	.931	5.36	.911	6.09
Carpentry	57	116	115.2	17.6	.925	4.82	.903	5.48
Civil Technology	26	62	63.4	13.3	.834	5.42	.796	6.01
Cosmetology	55	91	89.1	12.2	.888	4.08	.853	4.68
Diesel Engine	24	116	116.4	20.7	.944	4.90	.924	5.71
Electrical Install.	37	103	100.8	24.3	.947	5.59	.931	6.38
Electronics Comm.	67	92	87.9	20.7	.952	4.54	.941	5.03
Industrial Electrician	27	134	130.3	17.4	.902	5.45	.854	6.65
Industrial Electronics	32	99	95.3	22.6	.951	5.00	.938	5.63
Machine Drafting	66	105	102.7	12.9	.893	4.22	.850	4.99
Machine Trades	108	106	103.9	18.1	.914	5.31	.889	6.03
Masonry	11	78	76.6	6.6	.756	3.26	.594	4.21
Mechanical Tech.	6	28	29.2	4.9	.533	3.35	.348	3.96
Plumbing	10	100	102.5	14.4	.885	4.88	.813	6.23
Printing	47	79	76.8	11.5	.830	4.74	.769	5.53
Quantity Food Prep.	43	116	115.8	17.1	.874	6.07	.838	6.88
Sheet Metal	20	81	80.8	7.8	.739	3.98	.637	4.70
Small Engine Repair	18	124	116.8	27.7	.974	4.47	.962	5.40
Welding	69	97	98.8	14.5	.878	5.06	.836	5.87

KEY:

N = Number in test sample
Med = Median
Std Dev = Standard Deviation
KR20 = Estimated Reliability
KR21 = Estimated Reliability
SEKR20 = Standard Error of the Measurement
SEKR21 = Standard Error of the Measurement

TABLE 8

ITEM ANALYSIS OF NEW TESTS

Based on a NOCTI Study conducted between Fall 1977 and Spring 1978. The following measures were obtained:

	COMPUTER TECHNOLOGY	BUILDING TRADES MAINTENANCE
Sample Size	12	8
Items	180	186
Means (Percent)	69.2	62.8
(Raw Score)	124.6	114.9
Standard Deviation	8.4	12.3
Reliability (KR-20)	.89	.96
Standard Error of the Measurement	4.95	5.07

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TABLE 9

CUMULATIVE NATIONAL NORMS - Spring 1974 thru Spring 1978

EXAMINATIONS	WRITTEN TEST # of CAND	# of ITEMS	% CORRECT MIN	% CORRECT MAX	PERCENT MEAN	STD. DEV.	STD. ERR.	MED-IAN	PERFORMANCE TEST # of CAND	# of ITEMS	% CORRECT MIN	% CORRECT MAX	PERCENT MEAN	STD. DEV.	STD. ERR.	MED-IAN
AIR COND. & REFRIGERATION	148	165	38	86	68.2	8.9	.7	68	121	200	4	100	82.6	14.7	1.3	86
AIRFRAME & POWER PLANT	18	183	46	87	67.7	10.9	2.6	68	17	530	45	100	86.1	13.5	3.3	88
ARCHITECTURAL DRAFTING	34	150	41	81	65.9	9.5	1.6	67	34	220	5	100	74.6	21.2	3.6	80
AUTO BODY REPAIR	149	150	53	84	69.5	7.1	.6	70	147	215	44	100	85.3	11.1	.9	88
AUTO MECHANIC	604	200	41	85	65.4	8.9	.4	66	573	367	16	100	78.2	15.5	.6	82
BLDG. TRADES MAINT.	8	186	48	84	62.8	12.3	4.4	58	6	715	74	97	84.9	10.2	4.2	80
CABINET MAKING/MILLWORK	83	160	36	81	60.2	9.9	1.1	61	69	425	38	99	78.8	17.2	2.1	83
CARPENTRY	394	159	35	91	73.1	9.7	.5	74	365	120	12	100	66.0	20.4	1.1	65
CIVIL TECHNOLOGY	11	152	22	64	51.7	12.5	3.8	52	8	401	17	100	72.2	25.8	9.1	75
COMPUTER TECHNOLOGY	12	180	58	88	69.2	8.4	2.4	66	12	105	73	100	91.3	8.1	2.3	94
COSMETOLOGY	186	120	27	92	72.0	10.6	.8	72	181	122	34	100	79.6	12.8	.9	80
DIESEL ENGINE REPAIR	52	167	19	89	66.6	11.7	1.6	65	50	200	47	100	82.2	12.8	1.8	83
ELECTRICAL INSTALL.	155	177	32	81	54.1	8.6	.7	53	150	465	15	100	72.4	20.2	1.6	78
ELECTRONICS COMMUN.	119	130	32	95	69.5	14.8	1.4	70	112	660	16	100	83.1	17.9	1.7	88
INDUST. ELECTRICIAN	61	200	35	87	69.2	10.8	1.4	71	59	150	35	100	80.8	13.2	1.7	83
INDUST. ELECTRONICS	118	150	21	87	60.1	14.4	1.3	63	113	440	10	100	72.3	23.0	2.2	80
MACHINE DRAFTING	196	135	49	93	73.1	9.3	.7	73	174	130	2	98	76.2	15.7	1.2	80
MACHINE TRADES	318	160	22	87	58.1	9.7	.5	59	298	165	15	99	67.9	19.5	1.1	70
MASONRY	51	100	50	87	76.7	7.6	1.1	77	43	125	44	100	82.6	16.1	2.5	86
MECHANICAL TECHNOLOGY	3	65	40	49	45.6	4.9	2.9	40	3	225	49	92	63.6	24.6	14.2	49
PLUMBING	77	167	38	75	58.3	7.5	.9	57	74	125	12	97	75.2	16.3	1.9	78
PRINTING	111	131	24	76	51.7	10.9	1.0	53	103	160	41	100	77.8	14.6	1.4	81
QUANTITY FOOD PREP.	86	197	37	79	61.0	9.1	1.0	62	79	590	6	100	77.7	20.8	2.3	82
SHEET METAL	28	112	21	84	67.8	11.9	2.2	69	24	160	33	99	80.7	17.8	3.6	85
SMALL ENGINE REPAIR	54	165	59	86	73.7	5.8	.8	73	56	270	33	99	77.4	15.7	2.1	81
WELDING	186	155	34	83	60.9	10.3	.8	61	185	307	11	100	76.5	18.4	1.4	81